Small Business Innovation Research/Small Business Tech Transfer

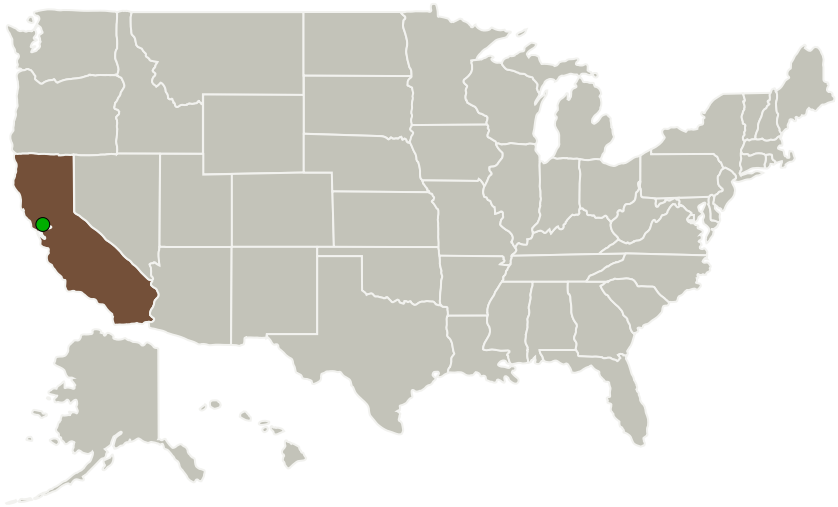
5D Task Analysis Visualization Tool, Phase II

Completed Technology Project (2017 - 2018)

Project Introduction

The creation of a five-dimensional task analysis visualization (5D-TAV) software tool for Task Analysis and Workload Planning using multi-dimensional visualization will have significant positive impacts on the optimization of human-centered design at NASA. Recent research identified a 40% improvement in task analysis accuracy and efficiency using 3D visualization. Employing enterprise data management innovation, configuration management, and loosely-coupled reusable libraries provides a unified data-driven 5D model portraying total complexity (risk, resources, workload, and duration) and process flow including conditional paths. Critical path and conflicts are accentuated with user controlled sensitivity thresholds for filters, indicators, notifications. The software tool promises increased awareness for human factors, project management, operations personnel, and system designers improving efficiency, accuracy, and understanding. Robotic activity developers and small spacecraft swarming coordinators are provided with an intuitive 3D design representation. These improvements will lead directly to improved system design, optimization of human and system allocations and conservation of resources for long-duration missions including sustainable habitats. The 5D-TAV tool's open architecture integrates open source software to provide the 2D rendering and 3D model views, filters, rotations, and controls necessary for successful task analysis optimization to ensure mission success.

Primary U.S. Work Locations and Key Partners



5D Task Analysis Visualization Tool Phase II, Phase II Briefing Chart Image

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Organizations Performing Work	Role	Type	Location
Ricardo Defense, Inc.	Lead Organization	Industry	Goleta, California
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations
California

Project Transitions

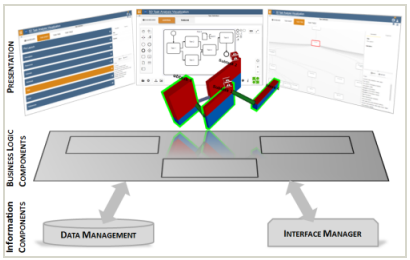
April 2017: Project Start

November 2018: Closed out

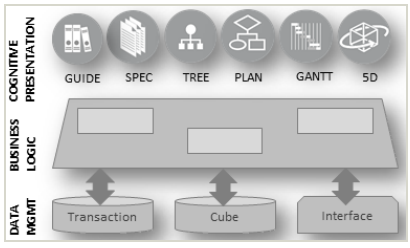
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140891)*

Images



Briefing Chart Image
5D Task Analysis Visualization Tool Phase II, Phase II Briefing Chart Image
(https://techport.nasa.gov/image/133881)



Final Summary Chart Image
5D Task Analysis Visualization Tool, Phase II
(https://techport.nasa.gov/image/129866)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Ricardo Defense, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

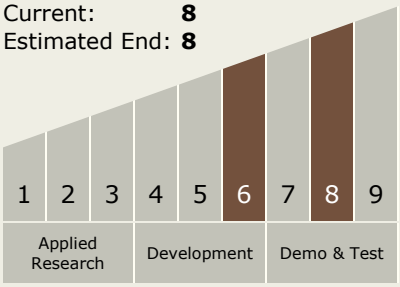
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Jonathan Dorny

Technology Maturity (TRL)

Start: **6**
Current: **8**
Estimated End: **8**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.6 Human Systems Integration
    - TX06.6.1 Human Factors Engineering

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System